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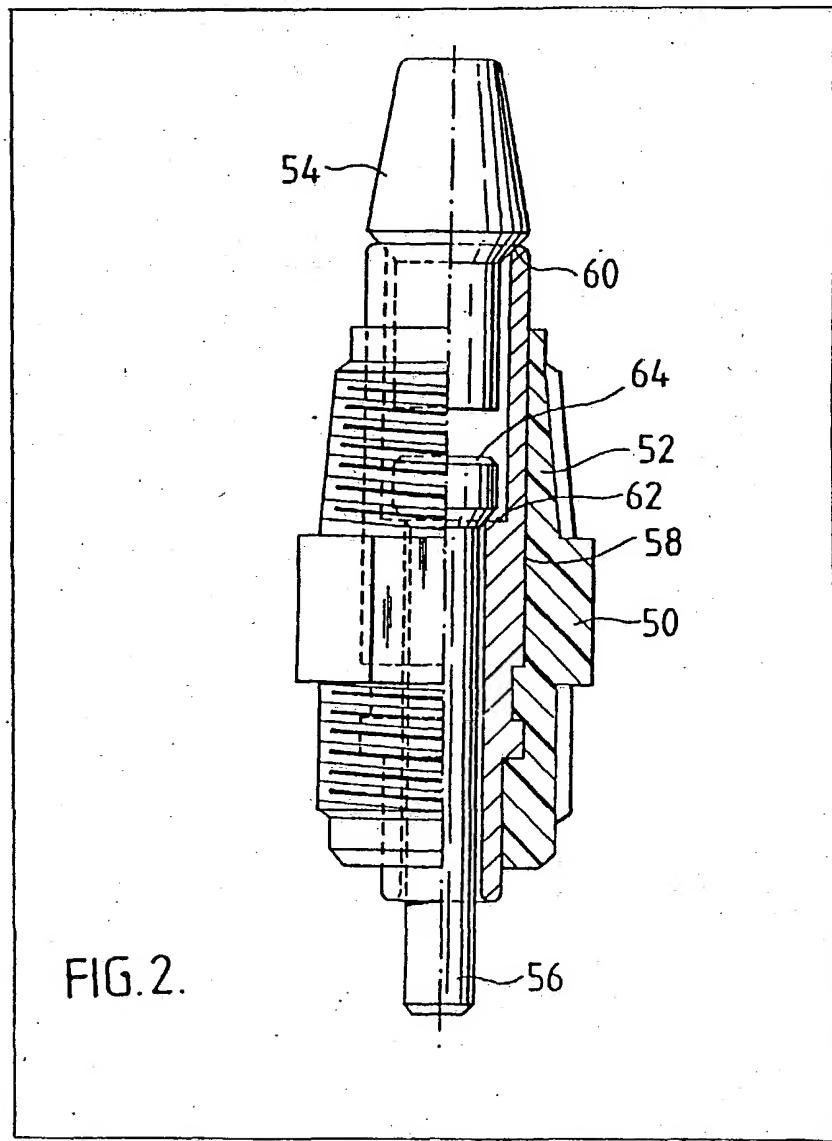
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(54) Animal drinkers

(57) A plastics body (50) includes a screw-threaded portion (52) which screws into the bottom wall of a drinking supply conduit (not shown). A stainless steel liner (58) extends through the body (50) and projects beyond either end of the body. The liner (58) is machined out of a single piece of stainless steel and includes a valve seat (60) at its uppermost end engaged by a dolly (54).

and a further valve seat (62) engaged by a head (64) of a pin (56) which projects below the plastics body (50). Upwards movement of the pin (56) by the beak of a bird causes the head (64) of the pin to rise and engage with the dolly (54) to allow water from the pipe or conduit to pass through the liner (58) to the bird.

The stainless steel liner (58) extends through the joint of the drinker with the pipe or conduit to reinforce the drinker and increase its resistance to bending or snapping due to forces transverse to the bore of the drinker.



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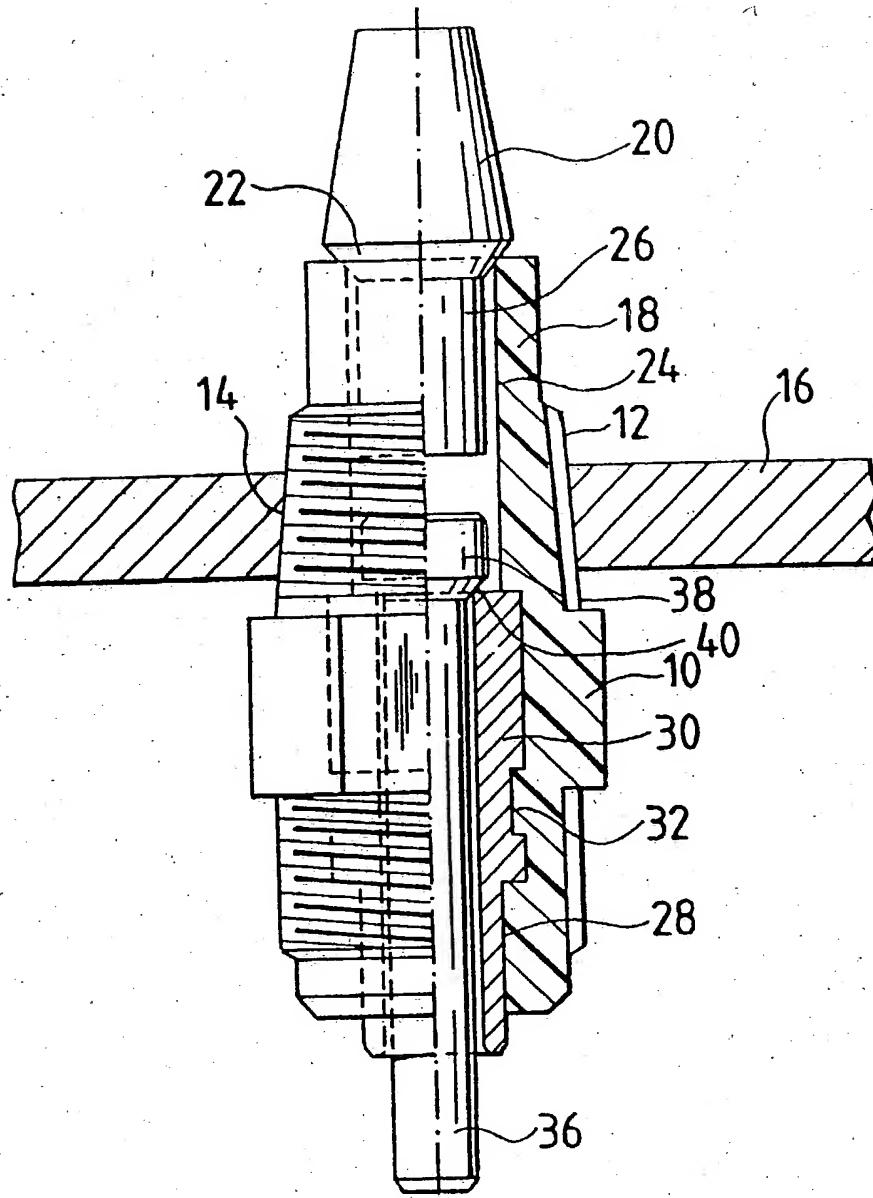


FIG.1.

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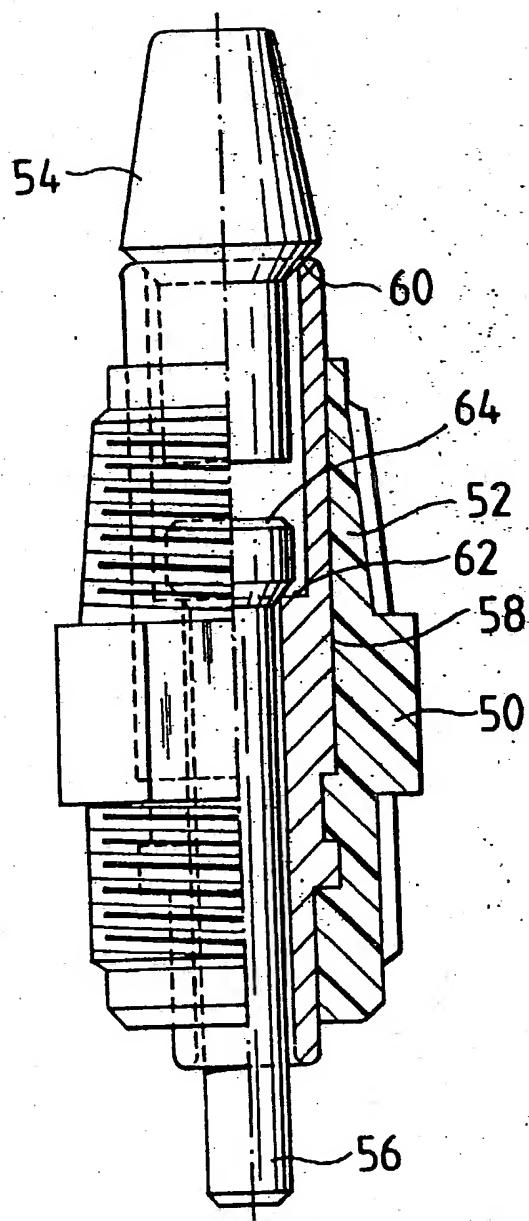


FIG. 2.

SPECIFICATION**Improvements in or relating to animal drinkers**

This invention relates to animal drinkers and more particularly to nipple drinkers of the kind wherein a valve member is adapted to be actuated to release a supply of water each time a projecting pin is displaced by the animal. Nipple drinkers are extensively used in watering arrangements for poultry, e.g. in broiler houses.

10 A well known form of nipple drinker has a plastics body which is screw-threaded externally for screwing into a water supply pipe or conduit. A problem with this type of construction is that if the part of the nipple drinker body which projects from the pipe receives a sideways blow (for example from a farm implement) the body snaps at or near the position where it emerges from the pipe, and this allows water to escape freely from the pipe, which besides being wasteful, also creates a nuisance. Furthermore, it is sometimes difficult to remove the part of the nipple drinker body which remains in the pipe.

15 20

According to one aspect of the present invention, a nipple drinker includes a plastics body arranged to extend into the wall of a drinking supply pipe or conduit, and an inner metal sleeve formed as a unitary structure extending through the body from that portion of the body which, in use, projects on the outside of the pipe or conduit into that portion of the body which is arranged to extend into the wall of a supply pipe or conduit. This metal sleeve provides a reinforcing element which extends through the region of the body where it is found that fractures sometimes occur and, being formed as a unitary structure does not have any weak joints such as would tend to fracture under relatively small forces. Thus the risk of fracture is greatly reduced.

The metal sleeve may be machined from a single piece of metal which only requires a single machine to hold the piece and thus reduces the time and cost involved in the manufacture of the sleeve.

Preferably the sleeve provides at least one valve seating within the drinker, and in the preferred construction, the sleeve provides a valve seat inside the body for a valve member formed on the actuating pin and a second valve seat at or near its upper end, for a top weight — sometimes called a "dolly". If the sleeve provides one or two valve seats, it is preferably made of stainless steel.

According to another aspect of the present invention, a nipple drinker includes a plastics body arranged to extend into the wall of a drinking supply pipe or conduit, and a continuous inner metal sleeve extending through the body from that portion of the body which, in use, projects on the outside of the pipe or conduit into that portion of the body which is arranged to extend into the wall of a supply pipe or conduit.

The invention will be better understood from the following description of a nipple drinker intended primarily for use with poultry and described here by way of example of the invention,

65 with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation drawn partly in section of a known form of nipple drinker, and

70 Figure 2 is a view similar to Figure 1, but showing a nipple drinker constructed in accordance with the invention.

The drinker shown in Figure 1 is of a kind which has been in use for several years, especially in broiler houses. It has a body 10 which is made as an injection moulding in Nylon 66 plastics material. This material is quite hard and gives the body appreciable resistance to deformation, and ability to resist pecking by birds. An upper region 12 of the body tapers somewhat and is screw-threaded, so that the body can be screwed into a screw-threaded hole 14 in the bottom wall of a water supply conduit 16. The conduit 16 is frequently made of square cross-section pipe, but for present purposes, only the bottom wall is illustrated. It will be noted however that the upper part of the body 10 projects upwardly into the conduit 16, and indeed there is a parallel sided portion 18 above the screw-threaded part 12.

A stainless steel top weight or dolly 20 has a part conical shoulder 22 which seats on the top edge of a bore 24 formed in the upper part of the body 10. The dolly 20 is free to move vertically but is held captive on the drinker. One way in which this may be achieved is to ensure that the gap between the top of the dolly and the underside of the top wall of the conduit 16 is less than the depth of a stem 26 which projects below the shoulder 22, so that the dolly 20 cannot become fully disengaged from the body 10. Alternatively, there may be an annular rib formed on the stem 26, and an annular internal lip formed in the bore 24, to provide a snap-in connection between the dolly 20 and the body 10, which will permit free vertical motion of the dolly, but prevent its complete release from the body of the drinker. It will be appreciated that the dolly 20 acts as a valve controlling the supply of water from the interior of the conduit 16 into the bore 24 of the nipple drinker.

110 There is a bore 28 of slightly larger diameter than the bore 24, coaxial with and extending downwardly from the bore 24 to the bottom end of the body 10. A stainless steel liner or sleeve 30 is fitted into the body 10, so that it lines the bore

115 28. The sleeve 30 has an annular groove 32, and the body 10 is moulded around the sleeve, so that the sleeve becomes keyed into the groove 32, thereby preventing axial displacement of the sleeve within the body. It will be observed that the bottom end of the sleeve 30 projects slightly below the bottom end of the body 10.

An actuating pin 36 is also provided and this is made in stainless steel, and is free to slide in the stainless steel sleeve 30. At its upper end, the pin 36 has a head 38 with a part conical shoulder 40, which normally seats on the top inside edge of the sleeve 30 due to gravity, as illustrated in Figure 1. In this normal or rest position, the lower end of the pin 36 projects below the bottom end of the

drinker body 10. The actuating pin 36 also acts as a valve, by virtue of its seating on the top end of the sleeve 30.

When birds peck at the projecting lower end of

- 5 the pin 36, the pin is lifted, and when it engages with the underside of the dolly 20, it lifts the dolly off the top end of the valve body 10; thereby opening the valve provided by the dolly and allowing water to flow into the bore 24. If the pin
- 10 36 is lifted at the same time, the water can then flow through the bore of the sleeve 30, and escape from the lower end of the sleeve, around the pin 36. The bird is thus able to obtain a supply of drinking water from the lower end of the drinker. The bore 24 fills with water, and as soon as the pin 36 is allowed to drop into its position of rest, the valve formed by that pin is closed, thus terminating the supply of water from the drinker. If the pin 36 is raised by only a small amount, such
- 15 that it does not contact the dolly 20, a very small quantity of water is allowed to escape from the bore 24, through the bore of the sleeve 30.

It should be understood, that the nipple drinker which has been described so far, and its method of operation is known. Sometimes, the projecting portion of the nipple drinker sustains a sideways blow, and there is a tendency for the body 10 to fracture in the region where the tapered portion 12 enters the bottom wall 16 of the water supply conduit. When this happens, the valve provided by the pin 36 is removed, allowing water to flow out of the bore 24, and the nipple drinker then becomes useless. Moreover, it is often quite difficult to remove the remaining part of the drinker body from the conduit.

Turning now to Figure 2, a nipple drinker which is provided by the invention is generally similar to that shown in Figure 1. Again there is a body 50 injection moulded in Nylon 66, and having a screw-threaded portion 52 which screws into the bottom wall of the conduit (not shown). The lower part of the body 50 may also include an external screw-threaded portion (not shown) to which a cup drinker (not shown) may be attached.

Furthermore, the body 50 is bored throughout its length, and there is a dolly 54 and an actuating pin which function in similar manner to the dolly 20 and actuating pin 36 of the known construction.

A stainless steel sleeve 58 is provided, and this fits into the bore of the drinker body 50, and the body 50 is moulded around it to secure the sleeve in position. However, the sleeve 58 extends throughout the length of the body 50, and is longer than the body 50, so that it projects both below and above the body as illustrated in Figure 2. The sleeve 58 is formed from a single block or tube of stainless steel. The sleeve 58 is machined out of the block or tube into the configuration shown in the drawings. A valve seat 60 is formed by the top inside edge of that part of the sleeve which projects above the top end of the body 50, and this seat 60 co-operates with the part conical shoulder formed on the dolly 54, to provide the first valve of the drinker. The bore of the sleeve 58 is enlarged at the upper end, so that a shoulder 62

is formed in the sleeve, and the top end of the bottom part of the sleeve bore forms a valve seat for a part conical shoulder between the main part of the actuating pin 56 and a head 64 formed on the pin 56. Thus, the second valve of the nipple drinker which is inside the drinker body, is also provided by the stainless steel sleeve.

- The drinker is screwed into the conduit, in exactly the same manner as the drinker illustrated in Figure 1, and the method of operation is exactly the same. However, there is a significant difference, in that the stainless steel sleeve 58 extends completely through the region where a fracture is likely to occur if the projecting part of
- 20 the drinker receives a sideways blow. In particular, the sleeve projects through the region at the junction of the enlarged central part of the body 50 and the tapered portion 52, and through the region where the tapered portion actually enters the wall of the conduit when the nipple drinker is screwed into position. Therefore, the reinforcing effect of the sleeve is available at the position where the stress is the greatest if the drinker receives a blow. As the sleeve 58 is continuous, or
- 25 has no joints along its length, the sleeve is able to withstand considerable sideways blows without fracturing. If the sleeve were to have a joint along its length then the joint which would be the weakest part, would be located in the region
- 30 95 where the forces tending to fracture the sleeve are the greatest.

It will be appreciated, that the stainless steel sleeve 30 illustrated in Figure 1, is really provided for the purpose of lining the bore of the body in which the actuating pin 36 slides. Any reinforcing effect is incidental, and is of little significance, because in any case, the lower part of the body 30 could hardly be subjected to any significant bending moment due to an applied horizontal force. However, the sleeve 58 in the construction illustrated in Figure 2, has a significant reinforcing action, and therefore this sleeve performs a dual function as distinct from the single lining function of the sleeve in the known construction.

110 CLAIMS

1. A nipple drinker including a plastics body arranged to extend into the wall of a drinking supply pipe or conduit and including an inner metal sleeve formed as a unitary structure
- 115 extending through the body from that portion of the body which, in use, projects on the outside of the pipe or conduit into that portion of the body which is arranged to extend into the wall of a supply pipe or conduit.
- 120 2. A nipple drinker as claimed in Claim 1 in which the metal sleeve is machined from a single piece of metal.
3. A nipple drinker as claimed in Claim 1 or 2 in which the metal sleeve provides at least one valve seating within the drinker.
- 125 4. A nipple drinker as claimed in Claim 3 in which the metal sleeve provides two valve seatings spaced from each other.

5. A nipple drinker as claimed in Claim 4 in which the end of the metal sleeve which, in use, is located innermost with respect to the pipe or conduit provides one of the valve seatings.
6. A nipple drinker as claimed in any preceding claim in which the metal sleeve extends beyond the plastics body at either or both ends of the drinker.
7. A nipple drinker as claimed in any preceding claim in which the metal sleeve is of stainless steel.
8. A nipple drinker including a plastics body arranged to extend into the wall of a drinking supply pipe or conduit, and a continuous inner metal sleeve extending through the pipe from that portion which, in use, projects on the outside of the pipe or conduit into that portion of the pipe which is arranged to extend into the wall of a supply pipe or conduit.
- 15 9. A nipple drinker constructed and arranged substantially as herein described with reference to, and as shown in the accompanying drawings.

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